



# Neuron

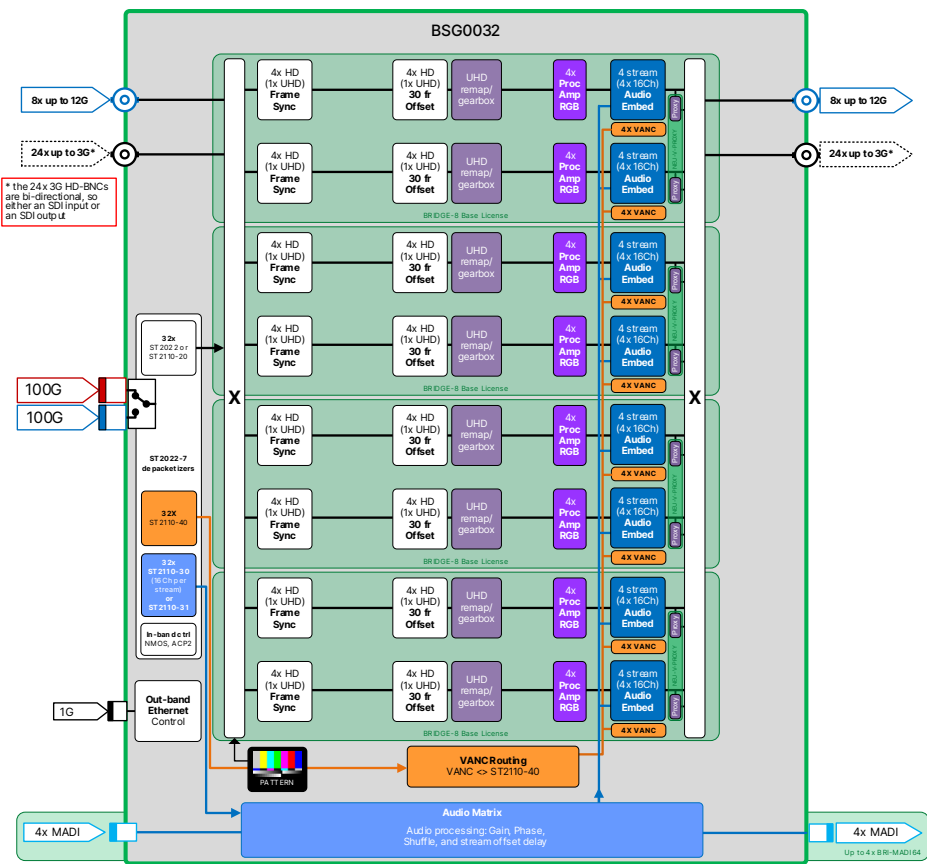
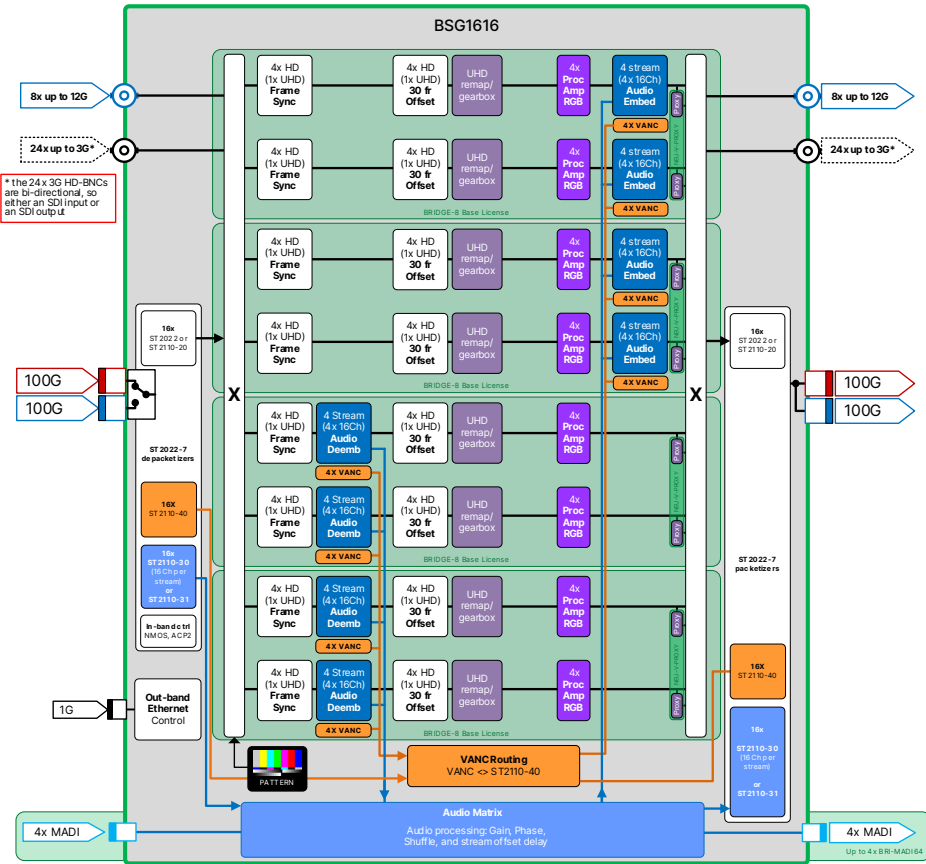
## BRIDGE

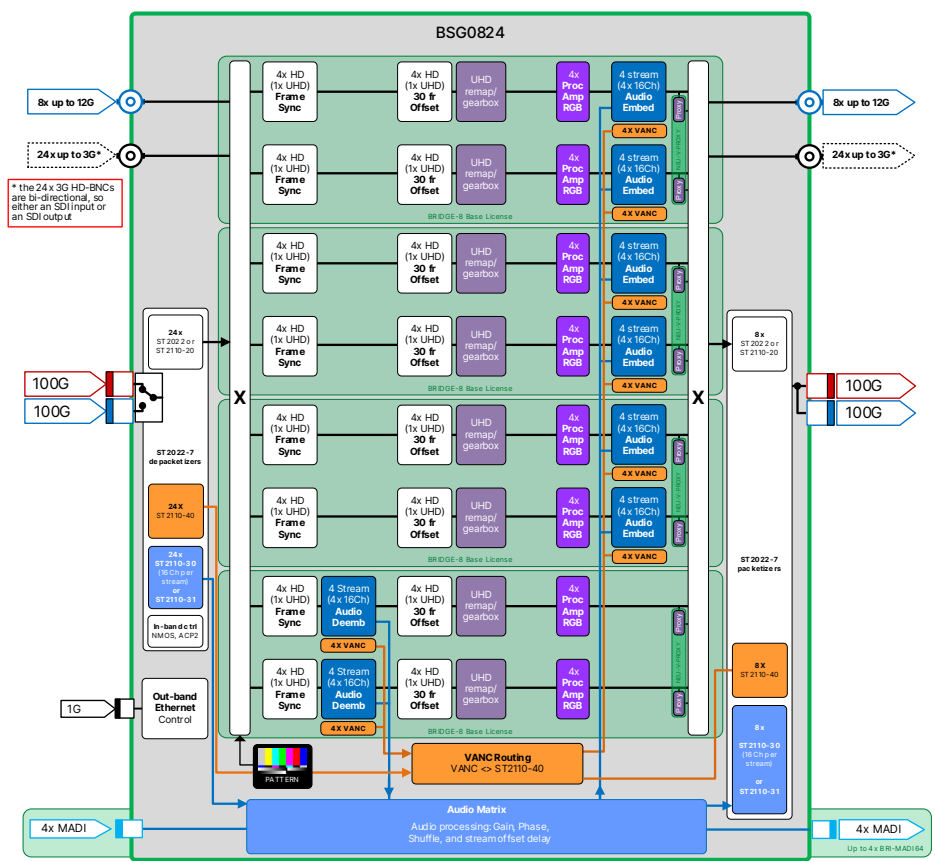
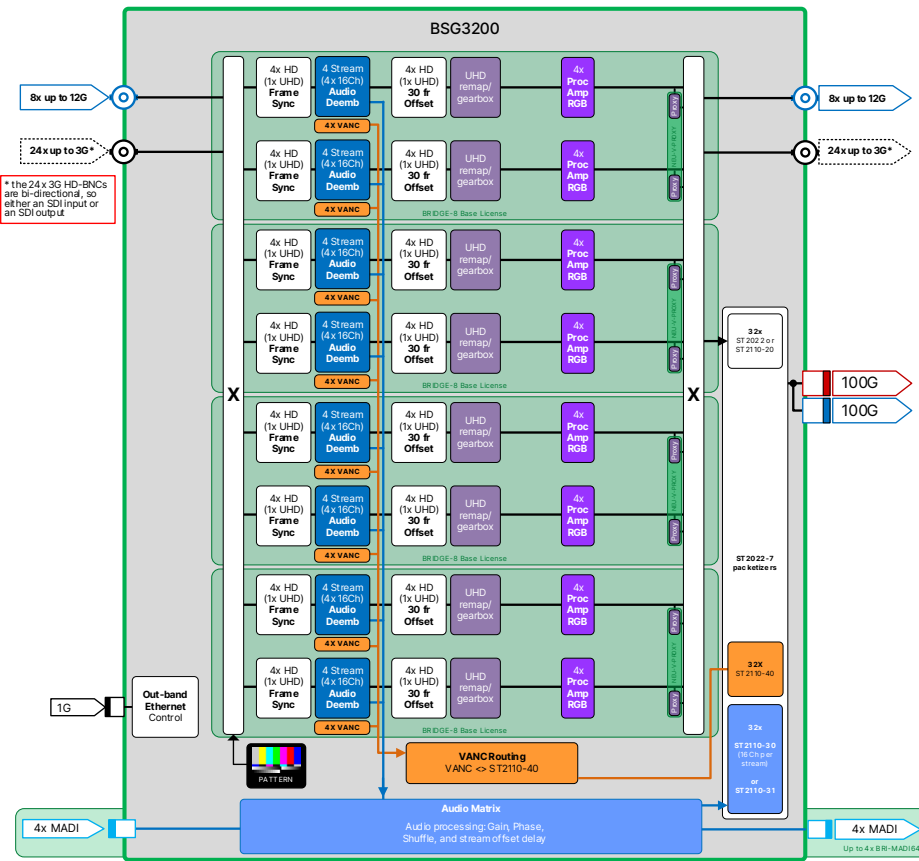
**IP gateway, bridge and synchronizer for IP, SDI and hybrid baseband video and audio**

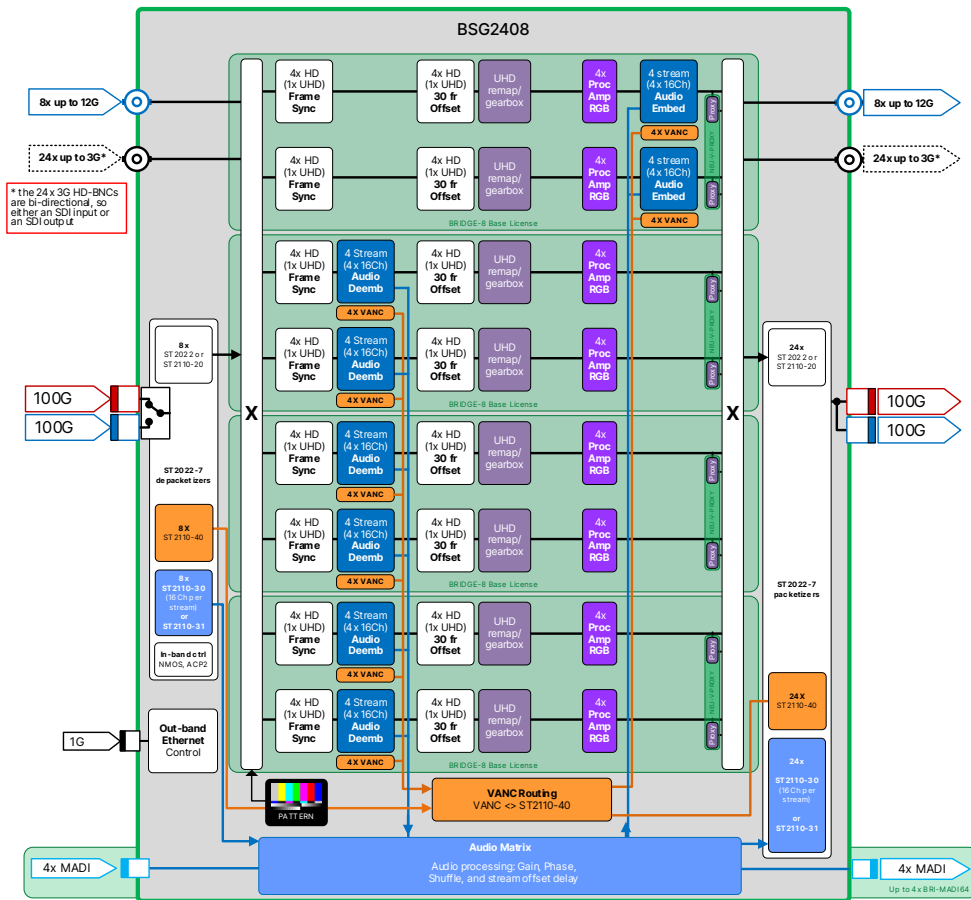


Due to constant product research and development, all specifications are subject to change without notice. EVS does not warrant or assume any legal liability or responsibility for the accuracy, completeness, availability and/or delivery of the products and/or services listed in this datasheet. Copyright © 2024 EVS

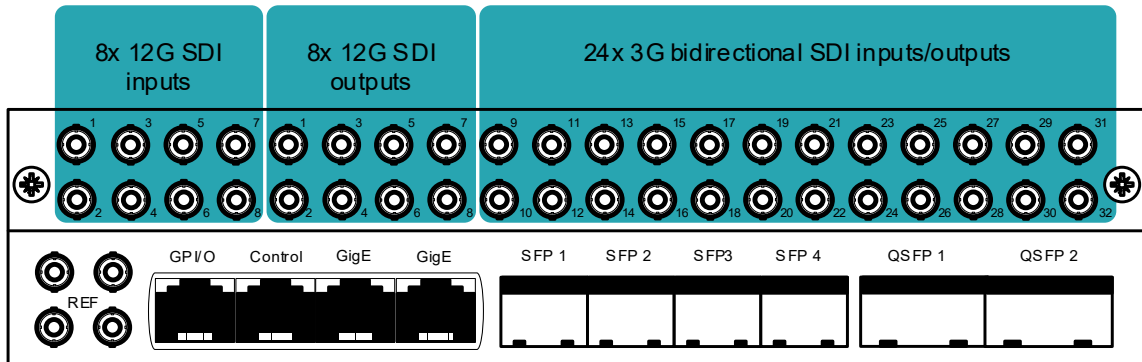
# Block schematics of configurations







## I/O Panel



BRIDGE offers up to 32 x 1080p (= 8 x 2160p) processing paths in various configurations. Depending on the chosen configuration, some paths will include de-embedding and some will include embedding. All paths include frame synchronization and delay, audio gain/phase/delay processing, and color-correcting proc amps. Optionally, the Bridge can generate downscaled 1080p proxies of each UHD stream, to send to Neuron View without it having to use the capacity of 4 inputs.

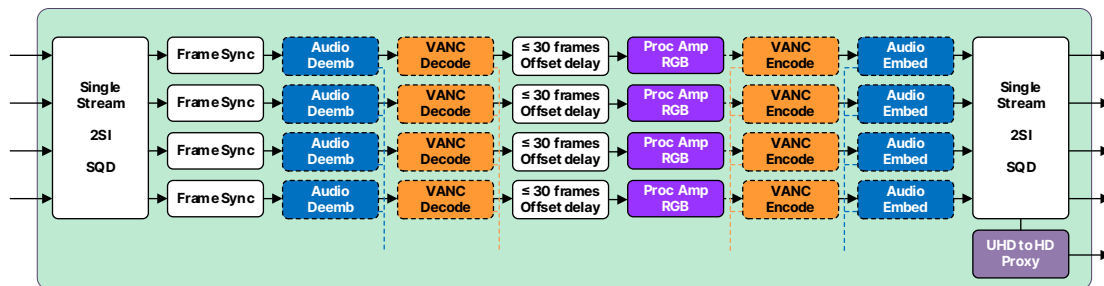
## I/O of configurations

	SDI Inputs <sup>1</sup>	IP Inputs <sup>1</sup>	SDI Outputs <sup>1</sup>	IP outputs <sup>1</sup>
<b>BSG3200</b>	32	0	0	32 <sup>2</sup>
<b>BSG2408</b>	24	8 <sup>2</sup>	8	24 <sup>2</sup>
<b>BSG1616</b>	16	16 <sup>2</sup>	16	16 <sup>2</sup>
<b>BSG0824</b>	8	24 <sup>2</sup>	24	8 <sup>2</sup>
<b>BSG0032</b>	0	32 <sup>2</sup>	32	0

<sup>1</sup>) amount of FHD (1080p50/59.94) channels

<sup>2</sup>) Redundant -7 streams

## Video Processing paths



The BRIDGE can have up to 8 of these UHD processing paths. Depending on the configuration, these processing paths include frame syncs, audio and VANC de-embedders (on the SDI to IP paths), video offset delay, VANC and audio embedders (on the IP to SDI paths), color correcting proc amps and audio gain/phase/delay functionality. Optionally, a Bridge can generate downscaled 1080p proxies of each UHD stream, to send to Neuron View without it having to use the capacity of 4 inputs.

## Audio Processing

The audio matrix below the processing paths allows audio shuffling of:

- The individual audio channels coming from the audio de-embedders
- The individual audio channels from the ST2110-30 inputs (each containing up to 16 audio channels)
- The individual audio channels from the optional MAD1 inputs (4x 64 channels)

These audio channels can also be individually gained and phased, and the streams can be delayed.

## Features

The BRIDGE is an SDI ↔ IP gateway developed for low-latency Live IP infrastructures. Supporting all modern encapsulation standards like ST2022 and ST2110, a Neuron BRIDGE card can process up to 32 x 1080p feeds (or up to 8x 2160p feeds) to and from SDI and IP via redundant 100GbE network interfaces. The various available configurations enable bridging in either direction in groups of 8 FHD (= 2 UHD) processing paths.

A Neuron BRIDGE can process up to 32 channels of video and multiple channels of audio in half a rack unit (since a single 1RU Neuron chassis can house 2 BRIDGE cards). Repackaging ST2022 to and from ST2110-20/30 is also possible. Each video channel is capable of frame-synchronizing, color correcting, de-embedding or embedding and audio gain/phase/delay. Combining four signal paths will offer UHD handling. Optionally, the Bridge can generate downscaled 1080p proxies of each UHD stream, for use in for instance Neuron View without it having to use the capacity of 4 inputs.

The extreme low carbon foot print of Neuron will lower your total cost of ownership in 24/7/365 environments. With around 250W of electrical power for a 1RU frame with 2 Neuron Bridge processors EVS offers one of the most efficient network attached processors in the market.

BRIDGE can optionally be equipped with the SDI expansion module, which supports up to 40 x SDI I/O via HD-BNC connectors. The SDI board activation license is always included.

- Supports asynchronous SDI and IP inputs
- Standards supported: UHD (single wire 2Si, 4 wire SQD/2Si), FHD Level-A, HD, SD SDI, ST2022 and ST2110 on 50Hz and 59.94Hz. (2160p, 1080p, 1080i and 720p)
- Up to 32 IP video I/O streams, 32 IP audio I/O streams and 32 IP ANC data I/O streams
- Up to 32 channels of bridging SDI to/from IP (requires optional SDI expansion board)
- Up to 32 channel frame-sync to local clock on external ref (B&B or ST2059)
- Up to 32 channels video offset delay of up to 30 frames (= 0.5 seconds of FHD/UHD and 1 second of 1080i/720p)
- Up to 32 times 16 channel audio de-embedding or embedding
- Up to 32 times Proc-amp for RGB, YCrCb and RGB-Black gains and black and white clip
- Audio gain/phase and stream offset delay
- Up to 8 downscalers to generate 1080p proxies of each UHD stream (optional)
- Up to 4x64 channels MADI IO (optional)
- Mono channel audio matrix of up to 768x768 (De-embedded audio, ST2110-30 inputs and optional MADI inputs), Controllable via SW-P-08 protocol
- Dual QSFP28 100Gb/s single-MAC
- Transparency of VANC data to ST2110-40 in SDI and vice versa with possibility to shuffle streams
- PTP Network timing with slave functionality, compliant with SMPTE ST2059-2 (BMCA)
- External black burst inputs
- Possibility to output 2x Analog bi-level reference locked to PTP fully adjustable over a frame in pixel increments
- Redundant IP streams in and out (double stream or ST2022-7 compliant)
- Video stream receivers are ST2022-7 class A/B/C/D compliant
- Multicast and unicast configurable per streams
- Automatic fan control
- Stream and Ethernet port redundancy
- Compatible protocols: ACPv2, DNS, IGMPv2, IGMPv3, LLDP, DHCP, SDP, NMOS IS04, NMOS IS05, 802.1as, ST2059-1/2, ST2022-6/7 class A/B/C/D, ST2110-20/30/31/40

## Applications

- Universal SDI ↔ IP bridge for IP-based infrastructures (requires SDI expansion board)
- Translating ST2022 to ST2110 streams and vice versa
- Conversion of MADI to/from IP streams
- Remapping/gearboxing UHD signals
- Point to point (back-to-back) applications for direct replacement of CWDM systems (requires optional SDI expansion board)
- System for distributed routing over an IP network with clean switching
- Outputs at shader position
- Ultra-fast clean switching

- Enabling local or remote productions over private or commercial networks
- Video frame synchronization
- Color correction and processing amplification
- Audio embedding and de-embedding from SDI and/or ST2022-6

## Ordering information

### Hardware options:

- **NEU-BASE-BOARD:** Neuron base processing board. Requires at least one of the base licenses listed below (no mix per board)
- **NEU-SDI40-BOARD:** Neuron SDI IO expansion board with 8x 12G in, 8x 12G out and 24 3G bidirectional IO on HD BNC. Requires NEU-BASE-BOARD.

### Software options:

- **BRIDGE-8-GO: Base License for Bridge** for 8x FHD or 2x UHD. Includes embedding, de-embedding, Proc amp, Audio Gain/Phase/Delay/Shuffle, Frame Sync, video delay and IP and SDI I/O. **Requires NEU-SDI40-BOARD** (SDI activation license is included). **Max. 4 of these base licenses per processing board (mixing configurations or base licenses on one board is not possible).**
  - Default configuration: BSG1616
  - Other available configurations: BSG0032, BSG0824, BSG2408, BSG3200
- **NEU-V-PROXY:** Video proxy license for 2x UHD proxy generation. Downscales 2 UHD input streams to 1080p for use in Neuron View. **Max. 1 per base license**
- **BRI-MADI64-GO: Bridge MADI I/O license.** 64 bi-directional channels. **Requires MSA SFP (not included).** **Max. 4 per processing board**

## Specifications

### Reference I/O

Connector Type	Micro BNC (HD BNC)
Number of inputs	1
Number of outputs	2, Loop input or analog reference out
Termination	75 Ohms when not looped
Bi-Level	PAL/NTSC Black Burst ITU624

### Gigabit Ethernet

Connector Type	RJ45
Number	3 (2 Future use)
Standards	10/100/1000 Base-T
Protocols streaming	
Protocol control	ACpv2
Cable	Shielded twisted pair

### QSFP Cages

Number of cages	2
Standards	QSFP28, 100GbE
Protocols	ST2022-6/7 (Class A/B/C/D), ST2110, AES67, ST2059

### SFP Cages

Number of cages	4
Standards	MADI
Protocols	MSA

### Serial video inputs (optional)

Standard	UHD ST2082, HD-SDI ST292, ST296 ST274 3G-SDI ST424 (Level A) ST425-1
Number of Inputs	8
Connector type	Micro BNC (HD BNC)
Signal Level	800mV
DC Offset	0V±0.5V
Overshoot	Within 10% of signal level
Return Loss	>15dB up to 1.5GHz, >10dB up to 3GHz

### Serial video outputs (optional)

Standard	UHD ST2082, HD-SDI ST292/ST296/ST274 3G-SDI ST424 (Level A)/ST425-1
Number of Inputs	8
Connector type	Micro BNC (HD BNC)
Signal Level	800mV
DC Offset	0V±0.5V
Overshoot	Within 10% of signal level
Return Loss	>15dB up to 1.5GHz, >10dB up to 3GHz

### Serial video bi-directional connections (optional)

Standard	HD-SDI ST292/ST296/ST274 3G-SDI ST424 (Level A)/ST425-1
Number of Inputs	24
Connector type	Micro BNC (HD BNC)
Signal Level	800mV
DC Offset	0V±0.5V
Overshoot	Within 10% of signal level
Return Loss	>15dB up to 1.5GHz, >10dB up to 3GHz

### Miscellaneous

Weight	Approx. 2050gr
Operating temp.	0°C to +40°C
Dimensions	400 x 193 x 42mm (LxWxD)

### Electrical

Voltage	+12V nominal (tolerance:-1V/+0.5V)
Power	100-200Watts